

Vol. V

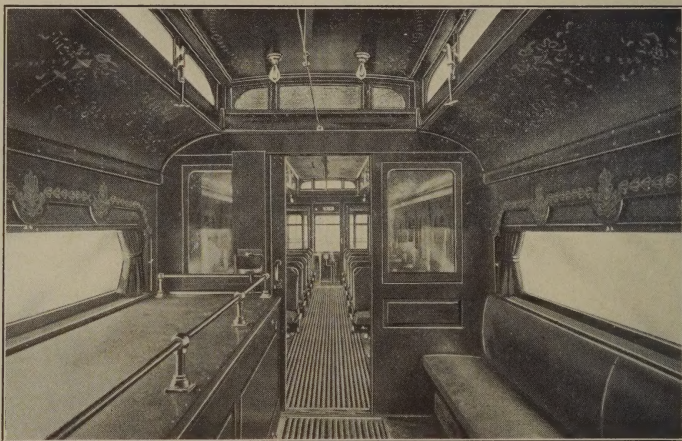
APRIL, 1911

No. 4

# BRILL MAGAZINE



Brooklyn Bridge



## FUNERAL CARS

The illustration is of the pallbearers' compartment of funeral cars furnished last year to the Chicago City Railway Company. The casket is carried in the enclosure at the left and is received therein through a full-length door on the outside of the car. This compartment can be arranged to have the casket rest in the center and have seats along both sides. Funeral cars for first, second and third-class service, operated with and without trail cars, are used in increasing numbers in the larger cities at home and abroad and, where the cemeteries are at a distance, are a boon to the public and a considerable source of income to the railway company.

**THE J. G. BRILL COMPANY**  
PHILADELPHIA - - - PENNSYLVANIA





*W. Blake*

EDITOR ELECTRIC RAILWAY JOURNAL

# BRILL MAGAZINE

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HENRY W. BLAKE

[WITH PORTRAIT INSERT]

HENRY W. BLAKE has been the editor of the *Electric Railway Journal* and of its predecessor, the *Street Railway Journal*, since 1894, and has been connected with the editorial department of this paper since January, 1891. The intervening years constitute the era of development of the modern electric railway. Early in this period the *Street Railway Journal* adopted a strong editorial policy, and by its industry in the collection of all of the facts, engineering, financial and corporate, relating to the new motive power, and by its constructive suggestions it soon became the recognized authority in this country and Europe, on all topics connected with city and interurban transportation. Moreover, as it was an earnest advocate from the first of the use of electricity as a motive power for these railways, it contributed an important part to the electric railway development of the past twenty years. Mr. Blake is a graduate of Yale in the class of 1886, and subsequently took a course in electrical engineering at the Massachusetts Institute of Technology. In 1888 he entered the employ of the Sprague Electric Railway & Motor Co., which was then engaged in equipping electric railways, and remained with that company and its successor, the Edison General Electric Co., until 1891. In the latter year he became associate editor of the *Street Railway Journal*. Mr. Blake has traveled extensively in this country and abroad. He is a member of a number of the principal engineering and railway associations and clubs in this country, and also of the Union Internationale de Tramways et de Chemins de Fer d'Intérêt Local, in Europe.

## CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE

### BROOKLYN\*

THE Borough of Brooklyn, City of New York, has a combination of street railway conditions distinctly its own. The development has been of the radiating order, with the center at a point opposite the lower end of Manhattan. In other cities of similar plan and development, the convergence is to a business center, but as the preponderance of traffic is via the Brooklyn Bridge, the concentration is at that point, with the complication of the lines carrying the heaviest traffic traversing the principal business thoroughfares. In addition to this, the situation is aggravated by the going and coming of the hordes of workers in the factories, warehouses and wharves which line the Brooklyn water front, at the same hours as the swarms of humanity which fill to overflowing the bridges, tunnels and ferries to Manhattan. It is this question of transporting both Manhattan and Brooklyn crowds without conflict that is the chief traffic problem. For many years the traction companies were utterly unable to furnish adequate transportation facilities, because the Brooklyn Bridge and its Manhattan terminus had long before reached their physical limitations. Brooklyn Bridge was opened in 1883, and for twenty years was the only means of communication by rail between Brooklyn and Manhattan. It was not till 1898 that the surface cars were permitted to cross the bridge and later in the same year elevated cars commenced to cross except during rush hours. The number and capacity of the ferries had not increased in that time, and with the increase in population from 600,000 in 1880 to 1,200,000 in 1900, it can be readily understood that the congestion at the bridge ter-

\* The twenty-eighth article of this series.



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Map of the Brooklyn Rapid Transit System. The circles with Figs. 1, 2 and 3 designate the points shown in the photographs. Fig. 1, front cover. Fig. 2, page 96. Fig. 3, page 97.

minals and in the narrow streets near the Brooklyn entrance had nearly reached a stage of strangulation when the second bridge was opened in 1904. This bridge, known as the Williamsburg Bridge, has a surface and elevated car capacity greater than the Brooklyn Bridge and therefore the tremendous pressure on the former systems was at once relieved and the traction companies were enabled to provide sufficient cars to adequately handle the rush hour traffic and to arrange a satisfactory routing system. In 1908 the Interborough Rapid Transit Tunnel was opened, furnishing through transportation between the center of Brooklyn and all points on the Manhattan subway system. The two bridges and the tunnel are sufficient for the present traffic, and the Manhattan Bridge now under construction will have still greater capacity than the Williamsburg Bridge and will meet the expansion of the next few years. The population of the Borough of Brooklyn according to 1910 census was 1,634,351.



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Loop around Borough Hall for cars which do not cross Brooklyn Bridge. At the left is the intersection of five of the busiest thoroughfares. The elevated structure is on Fulton Street which traverses the shopping district. Large office buildings surround the other sides of this triangle. This point is indicated by Fig. 2 on the map.



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Brooklyn end of the Williamsburg Bridge. Most of the lines of the eastern section of the system converge at this plaza and the greater part of the cars cross the Bridge. This point is indicated by Fig. 3 on the map.

With the exception of 49 miles of track of the Coney Island & Brooklyn Railroad and 3 miles of the Van Brunt Street & Erie Basin Railroad, the lines of the Brooklyn Rapid Transit comprise the entire surface and elevated trackage of the Borough, totaling 535 miles for the surface system and 71 miles for the elevated. During last summer, from May 1st to October 1st, a total of 1953 cars maintained were as follows: 452 convertibles, 554 semi-convertibles, 28 standard double-truck closed, 750 double-truck open and 169 single-truck open. During the summer a large number of cars were withheld from service, excepting on special days when the traffic was extremely heavy, as it is the practice to operate the open and lighter equipment in preference to the semi-convertible cars. The schedule of cars maintained for the current winter season, October 1st to May 1st, totals 1644 and is as follows:

452 convertibles, 554 semi-convertibles, 535 standard double-truck closed and 103 single-truck closed.

With the exception of a few short sections, the lines are all double-tracked and radiate from the two bridges to all parts of the Borough of Brooklyn and to various parts of the Borough of Queens. The addition of three-quarters of a million



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Standard closed car of the Brooklyn Rapid Transit System. Length of body, 28 ft. Length over vestibules, 38 ft. 3 $\frac{3}{4}$  in. Width over sills, 7 ft. Width over posts at belt, 7 ft. 9 in. Operated with two 60-h. p. motors. The cars are equipped with extending fenders and wheel guards; the fender is not shown in the photograph.

to the population of these two boroughs during the last ten years has called for long extensions to the principal lines which penetrate the outlying districts, as most of the population has established itself beyond a semicircle three miles distant from and centering at the Brooklyn end of the Brooklyn Bridge. The lines running to Coney Island and other points on the southern shore are about ten miles long, and three of

the lines which extend into the center of Queens are still longer. The radiation from the two bridges, which are  $1\frac{1}{2}$  miles apart, and running in the same general direction, forms crosstown lines and therefore the mileage for the population is low in comparison to other cities of the radiating plan which require a system of cross lines. The system has the



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Interior of car shown on opposite page. The longitudinal seats and accelerator doors enable these cars to load rapidly and therefore they are desirable for rush hour and Coney Island service. Seating capacity, 38. The window sashes drop into covered pockets. Single lights are placed along the rail over the windows and a row along the center of the dome.

advantage of furnishing the larger part of the transportation to Coney Island and other resorts by direct routes from the bridges and by other routes from various parts of the Borough during a six months' season and thereby furnishing a means of developing large sections along these routes without the usual attending loss to the railway company. The three great cemeteries reached by the lines are the largest in the



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Standard double-track open car of the Brooklyn Rapid Transit System. Thirteen benches, capacity 65.

five boroughs, and together with parks and club grounds, also have the same effect of economical traffic development in the outlying districts. The greatest expansion in the future of the City of New York must continue to be in these two boroughs because of their proximity to the business section of Manhattan, their accessibility, ample area and topography. Manhattan has an area of but 22 square miles and the Borough of the Bronx but 40, while Brooklyn has 77 and Queens 130.

Coincident with the opening of the Williamsburg Bridge and the rerouting of the entire system, the company instituted a thorough reorganization of every department and rehabilitation of all properties. The power service was insufficient to maintain the schedules and necessary additions to rolling stock could not be made nor could the electrification of the elevated division be completed; buildings were required to house the track and line departments and the facilities for storage and maintenance were totally inadequate; the diversity of types of car bodies, trucks and electrical equipments made it apparent that the task of standardization would be

difficult and expensive. The cost grew to \$40,000,000 in the five or six years required for its accomplishment.

The new order of things has been in existence for several years and has resulted most favorably in every direction. The rolling stock, which relates most closely to the comfort and convenience of the public, has received the necessary additions and the cars are maintained in a clean, comfortable and attractive condition, free from breakdowns. The improved equipment and service has reduced accident charges and produced economies in all directions. The last annual report reveals remarkable financial results of operation under the changed conditions. Every year from 1902 has shown an increase in passenger earnings, aggregating 66.2 per cent. for the entire system, of which percentage 36.4 was furnished by the surface division. The costs for damages for the entire system amounted to 6.88 per cent. of operating earnings in 1902; last year this expense was but 2.66 of the total operating earnings. The proportion of general operating expense—not including repairs, replacements, damages and legal expense—to operating earnings, was 35.52 per cent. last year as against 42.85 per cent. in 1902; the total operating ratio has been likewise gradually reduced from 65.41 in 1902 to 56.09 last year.



## INTERURBAN CARS FOR UNITED RAILWAYS SYSTEM OF PORTLAND, ORE.

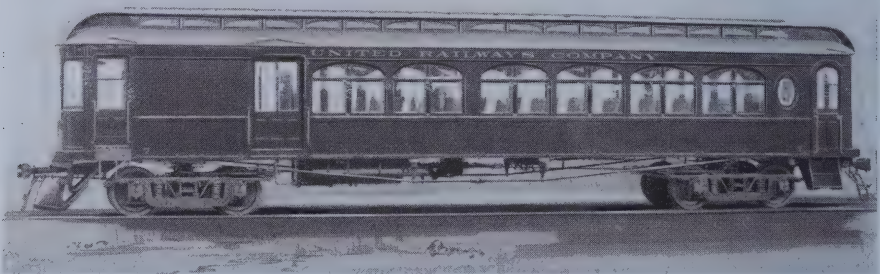
### PASSENGER AND COMBINATION TYPES

**E**ARLY in 1909 the American Car Company delivered the first cars operated on the new line of the United Railways System running west from Portland to Hillsboro and Forest Grove. These have been lately supplemented by similar cars built by The J. G. Brill Company. This line is



INTERURBAN CARS FOR UNITED RAILWAYS SYSTEM OF PORTLAND, ORE. Sixty-six passenger cars for trolley operation on fast schedules either singly or in trains. Doors in the center of the vestibules provide communication between cars.

27½ miles long and traverses the populous suburban district north of Portland along the bluffs on the west side of the Willamette River to its confluence with the Columbia River and continues for fourteen miles along the Columbia through a number of towns to Burlington, where it turns in a westerly direction and serves the towns which are at frequent intervals for another fourteen miles, till Forest Grove is reached. The company also has ten miles of track within the city of Portland which serves as an entrance for the interurban system, and also as a track connection for steam and electric freight lines. Another section of the system is under construction which runs south of the city. The country through which the lines pass has rich soil and is largely under cultivation, and there is much



INTERURBAN CARS FOR UNITED RAILWAYS SYSTEM OF PORTLAND, ORE.' The front platform is arranged as a motorman's compartment, as this type is for single-end operation.

valuable timber land throughout the district. The lines handle a comparatively large amount of heavy freight, chiefly at night, and excellent terminal facilities have been provided.

The new cars are of straight passenger and combination passenger, smoking and baggage types. Both types have the same general dimensions and the underframes are practically identical. Both are motor types equipped with M. C. B. couplers and air brake connections, and are arranged for single end operation. The straight passenger type has a hinged door at the entrance to the vestibules which swings back against the end of the car. The step opening between the door and the platform is fitted with a Pullman type of hinged trap. A swing door with 25-in. opening is at the center of the vestibule to permit passage between cars. The front vestibule of the



INTERURBAN CARS FOR UNITED RAILWAYS SYSTEM OF PORTLAND, ORE. The upper sashes are stationary and the lower sashes raise full height. The seats are Brill "Winner" type with 38-in. cushions and 24-in. backs.





INTERURBAN CARS FOR UNITED RAILWAYS SYSTEM OF PORTLAND, ORE. The passenger compartment seats 34, the smoking compartment 16, and two folding seats in the baggage compartment accommodate 10. The interior of these cars is finished in quartered oak.

combination type is arranged for a motorman's compartment and has no door at the center. The baggage compartment is furnished with cherry slat seats which fold against the walls; a 40-in. sliding door is provided at both sides. The compartments have hardwood partitions, and both types of cars are finished in golden oak, with headlinings, doors and sashes of the same.

|                                            |               |
|--------------------------------------------|---------------|
| Length of body, combination type . . . . . | 51 ft. 6½ in. |
| Length of body, pass. type . . . . .       | 46 ft. 10 in. |
| Length over platforms . . . . .            | 56 ft. 3 in.  |
| Length of platforms . . . . .              | 4 ft. 8½ in.  |
| Length of baggage comp't . . . . .         | 11 ft. 0 in.  |
| Length of smoking comp't . . . . .         | 10 ft. 8⅞ in. |
| Length of motorman's compartment . . . . . | 4 ft. 4¾ in.  |
| Centers of side posts . . . . .            | 2 ft. 8 in.   |
| Width over sills . . . . .                 | 8 ft. 8 in.   |
| Width over posts . . . . .                 | 8 ft. 8 in.   |
| Extreme width . . . . .                    | 8 ft. 10⅞ in. |

|                                                              |                      |
|--------------------------------------------------------------|----------------------|
| From track to sills . . . . .                                | 3 ft. 6¾ in.         |
| From sills over trolley boards . . . . .                     | 9 ft. 6⅜ in.         |
| From floor to headlining . . . . .                           | 8 ft. 9 in.          |
| From track to step . . . . .                                 | 17⅜ in.              |
| From step to plat., 3 steps . . . . .                        | each 10¾ in.         |
| Seating capacity, combination type . . . . .                 | 60                   |
| Seating capacity, pass. type . . . . .                       | 66                   |
| Motors . . . . .                                             | G. E. 73. 4-75 h. p. |
| Wt. of car body, less elec. equip., comb'n type . . . . .    | 62,100 lbs.          |
| Wt. of car body, less elec. equip., passenger type . . . . . | 61,600 lbs.          |

## HANDSOME CARS FOR THE MICHIGAN UNITED RAILWAYS

### PREPAYMENT TYPE

**T**HIRTY cars of the interesting type shown in the illustrations were recently delivered to the Michigan United Railways Company by The J. G. Brill Company, and have been put in commission on the lines at Jackson. The Michigan United Railways Company owns and operates the street railway systems of Jackson, Lansing, Kalamazoo and Battle Creek and the interurban lines between these cities of southern Michigan, about 225 miles of track in all.

The large windows are the principal feature which distinguishes these cars from the usual city types, and, while not novel, cars of this window arrangement are rarely seen. Cars of the same general style have been in operation in Jackson for several years. A striking appearance has been gained also by the rich effect of the selected mahogany with which the interiors are entirely finished, ceilings included. The platforms are 6 ft. long and are dropped 9 in. below the car floor. They are supported on heavy birch knees, the outside knees



HANDSOME CARS FOR MICHIGAN UNITED RAILWAYS. The windows have 4-ft. 6-in. centers. Platforms, 6 ft. long. The car was photographed on temporary trucks.



HANDSOME CARS FOR MICHIGAN UNITED RAILWAYS. Selected mahogany is used for the interior finish and headlinings of these cars.

being 3x8-in. reinforced with 7x3½x½-in. angles and the inside knees 3x6½-in. reinforced by 4x3x½-in. angles. The vestibules, as will be seen in the engraving, are hexagonal in shape and have three single-drop sashes; the front of the vestibules is sheathed with No. 14 steel. Double folding doors, hinged to the vestibule corner posts, are arranged to be replaced with gates during the summer. The doors in the body ends are of the mutually-operating sliding type and made of mahogany. Mahogany is also used for the window sashes, the upper of which are stationary and the lower drop into covered pockets. Hand rails with straps extend only over the longitudinal seats at the car corners. These corner seats accommodate five passengers each, and therefore, with six transverse seats on each side of the aisle, and allowing for the heater at one corner, the seating capacity is 42.

The bottom framing consists of 4x7 $\frac{3}{4}$ -in. side sills with sub sills and a 12x $\frac{3}{8}$ -in. steel plate between, extending the full length of the car. The 3 $\frac{1}{2}$ x4 $\frac{1}{4}$ -in. stringers are reinforced with 4x3x $\frac{1}{2}$ -in. angles. The oak end sills are 5 $\frac{1}{4}$ x6 $\frac{7}{8}$ -in. and the four oak crossings are 3 $\frac{1}{2}$ x4 $\frac{1}{4}$ -in. Trap doors are provided for two motors of GE-80 type.

|                               |                           |                                |                           |
|-------------------------------|---------------------------|--------------------------------|---------------------------|
| Length of body . . . . .      | 28 ft. 0 in.              | From sills over trolley boards | 8 ft. 7 $\frac{7}{8}$ in. |
| Length over platforms . . . . | 40 ft. 0 in.              | From floor to headlining . .   | 7 ft. 7 $\frac{1}{2}$ in. |
| Length of platform . . . . .  | 6 ft. 0 in.               | From track to step . . . . .   | 15 $\frac{5}{8}$ in.      |
| Centers of side posts . . . . | 4 ft. 5 $\frac{1}{8}$ in. | From step to platform . . .    | 14 $\frac{1}{2}$ in.      |
| Width over sills . . . . .    | 8 ft. 0 in.               | From platform to car floor .   | 9 in.                     |
| Width over posts . . . . .    | 8 ft. 2 $\frac{1}{2}$ in. | Seating capacity . . . . .     | 42                        |
| Extreme width . . . . .       | 8 ft. 5 $\frac{1}{4}$ in. | Wt. of car body with heater .  | 16,440 lbs.               |
| From track to sills . . . . . | 2 ft. 8 $\frac{1}{4}$ in. |                                |                           |

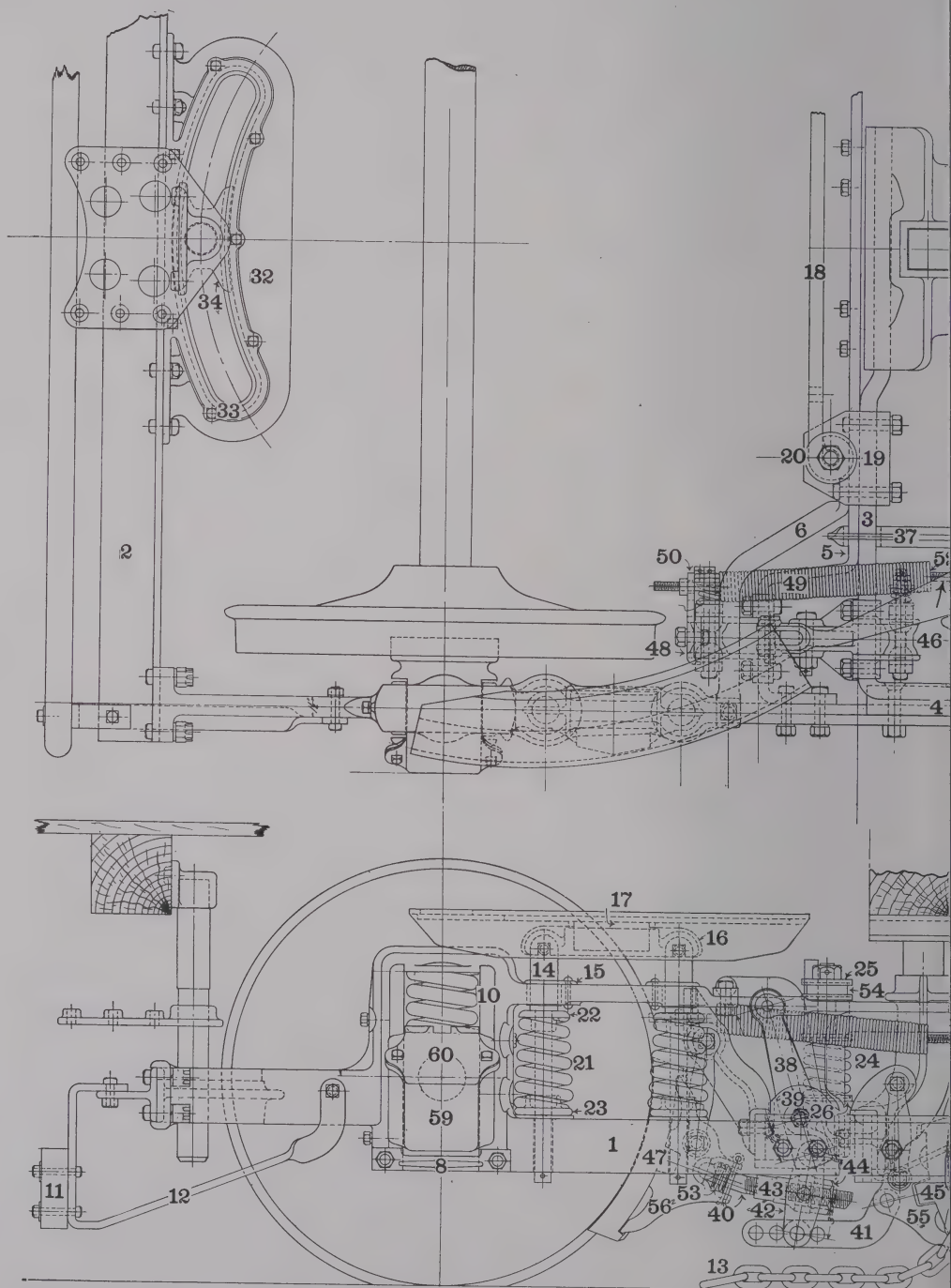


## ONE-MAN PREPAYMENT CARS FOR SELMA, ALA.

### FLUSH PLATFORMS

A NOVEL type of car was recently designed and built for the Selma Street & Suburban Railway by The J. G. Brill Company which should be of interest to operators of street railways in small cities and of suburban lines, where it is not necessary to have a speed of more than 20 miles an hour. While it costs less than the usual type with the same seating capacity, it does not look like a cheap car, for the design is along the familiar lines of a modern double-truck car. Now that the Brill plain arch roof has become known by railway men and its adoption becoming general, it no longer produces an odd effect by the simplicity of its lines, but instead looks distinctly modern, while the monitor style is beginning to look old-fashioned. However, it is not appearance, but practical advantages and better service that



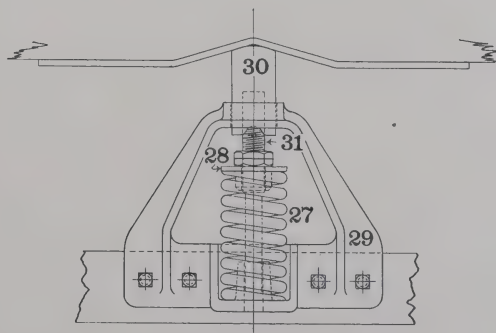
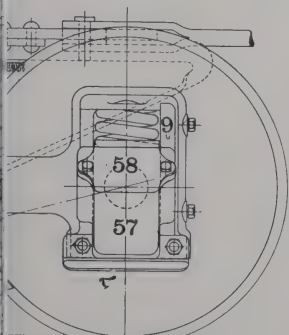
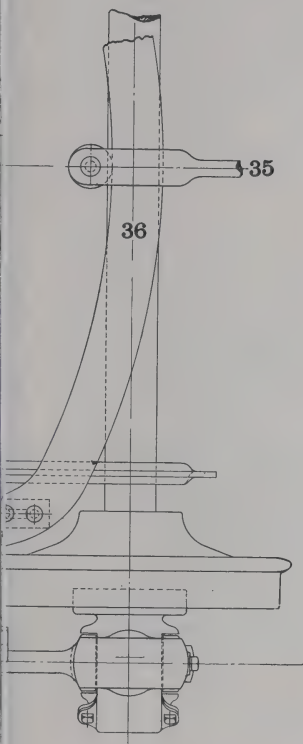


# 22 TRUCK

ENTED)

## Names of Parts

- 1 Side Frame
- 2 End Frame
- 3 Cross Bar
- 4 Cross Bar Carrier
- 5 Brake Hanger Carrier
- 6 Spring Post Frame Extension Brace
- 7 Pedestal Cap (Trail)
- 8 Pedestal Cap (Motor)
- 9 Pedestal Gib (Trail)
- 10 Pedestal Gib (Motor)
- 11 Wheelguard
- 12 Wheelguard Bracket
- 13 Safety Chain
- 14 Body Spring Post
- 15 Body Spring Post Bushing
- 16 Side Bearing
- 17 Side Bearing Wear Plate
- 18 Motor Suspension Bar
- 19 Motor Suspension Spring Bracket
- 20 Motor Suspension Bar Bolt
- 21 Body Spring
- 22 Body Spring Cap
- 23 Body Spring Seat
- 24 Motor Suspension Spring (Lower)
- 25 Motor Suspension Spring Cap (same for upper and lower springs)
- 26 Motor Suspension Spring Seat (same for upper and lower springs)
- 27 Compression Spring
- 28 Compression Spring Cap
- 29 Compression Spring Bracket
- 30 Compression Block
- 31 Compression Spring Post
- 32 Radial Casting
- 33 Radial Casting Plate
- 34 Radial Block
- 35 Brake Rod (Stub with Jaw and Roller)
- 36 Radius Bar
- 37 Radius Bar Slide
- 38 Live Lever
- 39 Live Lever Fulcrum
- 40 Bottom Truck Connection (Driving Wheel)
- 41 Bottom Truck Connection (Trail Wheel)
- 42 Brake Link
- 43 Bottom Truck Connection Nut
- 44 Bottom Truck Connection Jam Nut
- 45 Brake Shoe (Trail Wheel)
- 46 Brake Hanger (Trail Wheel)
- 47 Brake Shoe (Driving Wheel)
- 48 Brake Hanger (Driving Wheel)
- 49 Brake Release Spring
- 50 Brake Release Spring Holder
- 51 Brake Release Spring Bolt
- 52 Brake Release Spring Nut
- 53 Brake Rod Spring
- 54 Motor Suspension Spring (Upper)
- 55 Brake Head (Trail Wheel)
- 56 Brake Head (Driving Wheel)
- 57 Journal Box (Trail Wheel)
- 58 Journal Box Lid (Trail Wheel)
- 59 Journal Box (Driving Wheel)
- 60 Journal Box Lid (Driving Wheel)





count, and the Brill roof has demonstrated these. The flush platforms, with single doors for entrance and exit at diagonally opposite corners of the car, together with the absence of bulkhead, chiefly distinguish the plan. A simple lever contrivance operates the door and step simultaneously from a handle within reach of the motorman's left hand, and by closing the door and removing the handle the door is securely locked. The motorman can therefore control the situation as



ONE-MAN PREPAYMENT CARS FOR SELMA, ALA. Arranged for double-end operation, with a sliding door at diagonally opposite corners. The door and step are operated simultaneously by the motorman-conductor. An inexpensive type to build, operate and maintain. Mounted on Brill No. 21-E Truck.

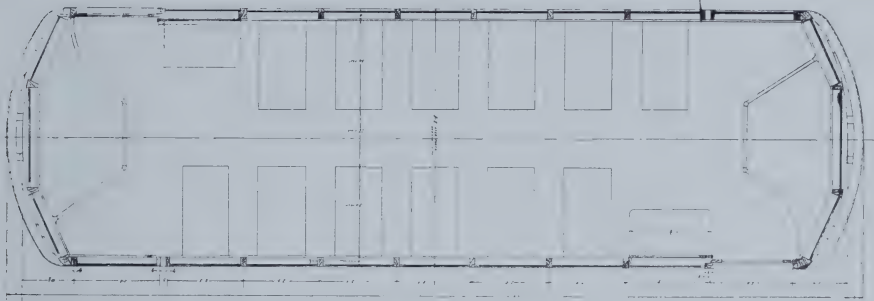
in the days of the "bob-tail" horse car, when the driver closed the rear door with a lever from his enclosed platform and could thus prevent a passenger from leaving till he had deposited his fare in a glass box. This "bob-tail" car, by the way, was introduced about 1865, and played an important part in the development of street railways, for at that time many lines were being operated at a loss with the larger cars in vogue, having a platform at each end and requiring both conductor and driver. The little one-horse car with its single door and step at the rear and one-man crew was an inexpensive and light equipment, economical in power and operation,

and made it possible to develop traffic at a profit instead of at a loss, and on large systems was used to provide a more frequent and quicker service. The one-man prepayment car, particularly the Selma type, will be seen therefore to be closely analogous to the "bob-tail" car, and with a fare box the analogy is complete.



ONE-MAN PREPAYMENT CARS FOR SELMA, ALA. The upper sashes raise into pockets and the lower sashes drop. The end sashes also drop, allowing a free rush of air through the car, if desired.

The Selma cars are constructed on a substantial under-frame composed of 4 by 4 $\frac{3}{4}$ -in. wheel pieces; 7 by 3 $\frac{1}{2}$  by  $\frac{1}{2}$ -in. wheel piece angles; 3 $\frac{3}{8}$  by 4 $\frac{3}{4}$ -in. side sills; 3 $\frac{1}{2}$  by 4 $\frac{3}{4}$ -in. crossings with 4 by 3 by  $\frac{1}{2}$ -in. angles at each crossing. The door openings are 2-ft. 6-in. wide and the windows centers are 2-ft. 5-ins. Double-sash windows of the Stephenson semi-convertible type leave the openings entirely clear, when desired, as the upper sashes slide up into pockets and the



ONE-MAN PREPAYMENT CARS FOR SELMA, ALA. The seating capacity is 28. There is space for a longitudinal double seat opposite the door at each end, if desired. Where lines are arranged for single-end operation of cars the seating capacity can be 40.

lower sashes drop into the side walls. All three end-sashes drop into pockets, and therefore when side and end windows are all open there is nothing to prevent a free current of air sweeping through, the same as in an open-sided summer car. The interiors are finished in ash with slat seats of the same and of the Brill "Winner" type. Brill No. 21-E trucks are used and have a wheel base of 7 ft. 6 in. and wheel diameter of 33 in.

Selma is located close to the center of the State of Alabama, 40 miles west of Montgomery, the capital, and 80 miles south of Birmingham, the metropolis, and is connected with both cities by direct railway routes. The lines of the Selma Street & Suburban Railway Company are  $8\frac{1}{2}$  miles long, with 12 motor and 11 trail cars in operation. Heavy freight is handled over the lines at night. An amusement park owned by the railway company is the only attraction of the kind in the neighborhood and draws large crowds during the season.

The principal dimensions of the cars are as follows:

|                                          |                          |                                                         |                      |
|------------------------------------------|--------------------------|---------------------------------------------------------|----------------------|
| Length of body over vestibules . . . . . | 26 ft. 0 in.             | Step tread to car floor . . . . .                       | 16 in.               |
| Centers of side posts . . . . .          | 2 ft. 5 in.              | Seating capacity . . . . .                              | 28                   |
| Width over sills . . . . .               | 8 ft. 2 in.              | Type of truck . . . . .                                 | Brill 21-E           |
| Width over posts . . . . .               | 8 ft. 2 in.              | Motors . . . . .                                        | West, 12-A—2-25 h.p. |
| Extreme width . . . . .                  | 8 ft. $5\frac{3}{8}$ in. | Weight of car body, less electrical equipment . . . . . | 9,140 lbs.           |
| Height track to sills . . . . .          | 2 ft. $7\frac{1}{8}$ in. | Wt. of trucks . . . . .                                 | 5,360 lbs.           |
| Height over trolley boards . . . . .     | 8 ft. $9\frac{3}{8}$ in. | Wt. of motors . . . . .                                 | 5,400 lbs.           |
| Height floor to head lining . . . . .    | 8 ft. $1\frac{3}{4}$ in. | Total weight . . . . .                                  | 19,900 lbs.          |
| Track to step tread . . . . .            | $18\frac{1}{2}$ in.      |                                                         |                      |

## COMBINATION CARS FOR ONTARIO, CAL.

## CALIFORNIA TYPE

THE car illustrated is of an order of three delivered a few weeks ago to the Ontario & San Antonio Heights Railroad Company of Ontario, Cal., by the G. C. Kuhlman Car Company. The railway line is about ten miles long and extends from Ontario to San Antonio Park, an amusement park owned by the company. Ontario is situated midway between the cities of Los Angeles and San Bernardino in the southern part of California on the Southern Pacific and the San Pedro, Los Angeles & Salt Lake Railroads. The line runs directly north from Ontario and crosses the Santa Fe main line at Upland, furnishing a means of connection between points on the three lines of steam roads which run parallel to each other, and continuing north to the park at the end of the route. This park contains 30 acres and adjoins the land on which the power plant is located. The line traverses a beautiful country with mountain ranges on all sides, and climbs the lower slopes of the San Gabriel Range to a height of 2200 ft. above sea level and 1200 ft. above Ontario.



COMBINATION CARS FOR ONTARIO, CAL. These are the first cars of the California type to be mounted on Brill No. 39-E single-motor trucks.



COMBINATION CARS FOR ONTARIO, CAL. This combination type has been popular in all parts of California and other parts of the Pacific Coast for many years. Seating capacity 40, 16 in the closed compartment.

The California type of car was originally used in San Francisco on the cable lines about thirty years ago and has been very popular on the coast ever since. The mild climate throughout the year, with prevailing clear weather and cool nights, calls for both open and closed cars; therefore by combining the two an ideal type is obtained, evidently suited to all the conditions, and wherever used the problem of light-weight cars is already solved.

These are the first of the California type to be mounted on Brill No. 39-E single-motor trucks and the advantage in a car of this length is apparent, as the truck centers are permitted to be farther apart and the body carried lower than if on trucks having all wheels of equal size. Again, this a light car body, and although the grades on the line are heavy, the two motors

of 65 h.p. each are ample for the service, and thus a completely efficient and at the same time economical equipment is provided.

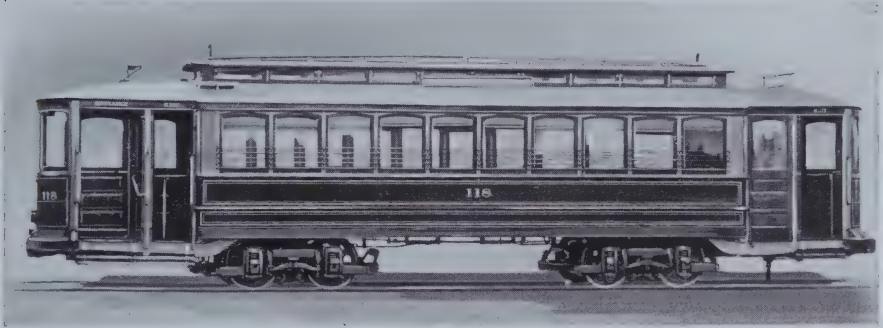
|                                             |               |                                                                                         |                  |
|---------------------------------------------|---------------|-----------------------------------------------------------------------------------------|------------------|
| Length of body . . . . .                    | 26 ft. 3 in.  | From floor to headlining . . .                                                          | 8 ft. 0½ in.     |
| Length over platforms . . .                 | 37 ft. 2 in.  | From track to step . . . . .                                                            | 12½ in.          |
| Length of front platform . .                | 5 ft. 5½ in.  | From step to platform, 12½ in. and 12½ in.                                              |                  |
| Length of rear platform . . .               | 5 ft. 5½ in.  | Seating capacity . . . . .                                                              | 40               |
| Centers of side posts . 32⅞ in. and 29⅛ in. |               | Type of trucks . . . . .                                                                | Brill 39-E       |
| Width over sills . . . . .                  | 7 ft. 10½ in. | Motors . . . . .                                                                        | GE-210—2-65 h.p. |
| Width over posts at belt . . .              | 8 ft. 2 in.   | Weight of car body with electrical and air brake equipment, trucks and motors . . . . . | 35,960 lbs.      |
| Extreme width . . . . .                     | 8 ft. 5 in.   |                                                                                         |                  |
| From track to sills . . . . .               | 31⅛ in.       |                                                                                         |                  |
| From sills over trolley boards              | 8 ft. 11¼ in. |                                                                                         |                  |



## PREPAYMENT CARS FOR CHATTANOOGA, TENN.

### INITIAL EQUIPMENT

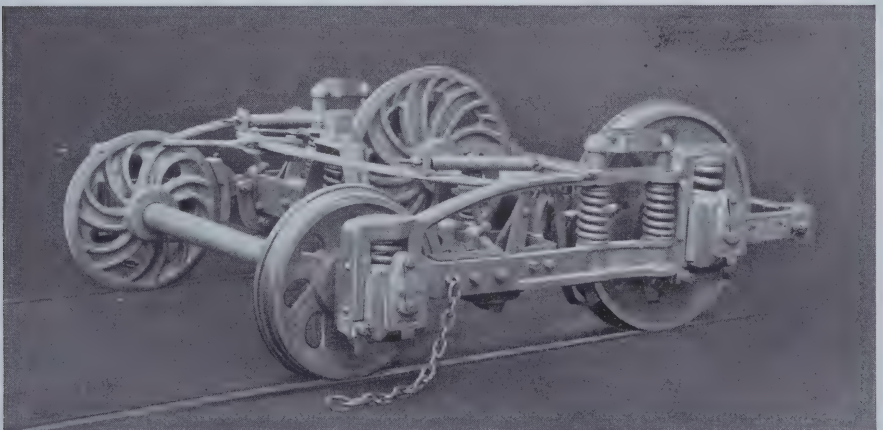
THE first ten cars of the P-A-Y-E type to be operated in Chattanooga were put on the lines a few weeks ago and were furnished by the G. C. Kuhlman Car Company. The Chattanooga Railway & Light Company, which operates all of the street railway lines in Chattanooga, is one of the group of Clark properties which have been referred to in previous issues as equipping with prepayment cars mounted on Brill No. 22-Special single-motor trucks. The cars of these roads have the same platform arrangements, but differ in seating plans to comply with local conditions. Chattanooga has wide streets and a generous strip between the tracks; therefore the cars are wide and the seating plan of the transverse type, with no longitudinal corner seats, but instead a transverse seat for one person at each corner. The usual corner grip handles on the seat backs are omitted and in their place



PREPAYMENT CARS FOR CHATTANOOGA, TENN. Ten of these cars, built by the G. C. Kuhlman Car Company, constitute the initial P-A-Y-E equipment of the Chattanooga lines. This car was photographed on temporary trucks. The cars will be mounted on Brill No. 22-Special single-motor trucks, shown below.

hand rails with straps are provided for the full length of the car. Windows of the single-light drop-sash type are used, with hinged covers to the pockets, and five-bar window guards enclose the lower half of the window openings.

The doors on the entrance side of the platforms are hinged to a central post and fold against the P-A-Y-E railing, which extends from this post to the bulkhead. The entrance and exit doors and their folding steps are mechanically operated, and the exit door in the body end is also opened and closed by a lever. The underframing of the cars is composed of



PREPAYMENT CARS FOR CHATTANOOGA, TENN. Brill No. 22-Special single-motor truck standard on the Chattanooga system and used under the above cars. The truck is equipped with a 65 h. p. motor.



PREPAYMENT CARS FOR CHATTANOOGA, TENN. Single transverse seats take the place of the usual longitudinal corner seats. The cars are wider than usual, being 8 ft. 5 in. over the side posts. Seating capacity 36.

4 x 7-in. side sills reinforced with 15 1/2 x 3/8-in. plate with 2 1/2 x 2 1/2 x 1/2-in. angles riveted to the top and bottom, giving the construction the general characteristics of a Z-bar. The end sills are white oak 5 1/4 x 7 in., reinforced with 6 x 1/2-in. steel. Aside from the plate and wood side sills there are no longitudinal members, the crossings and diagonal braces being designed to resist the lateral and cornerwise stresses, and the side members to sustain the vertical load and strains.

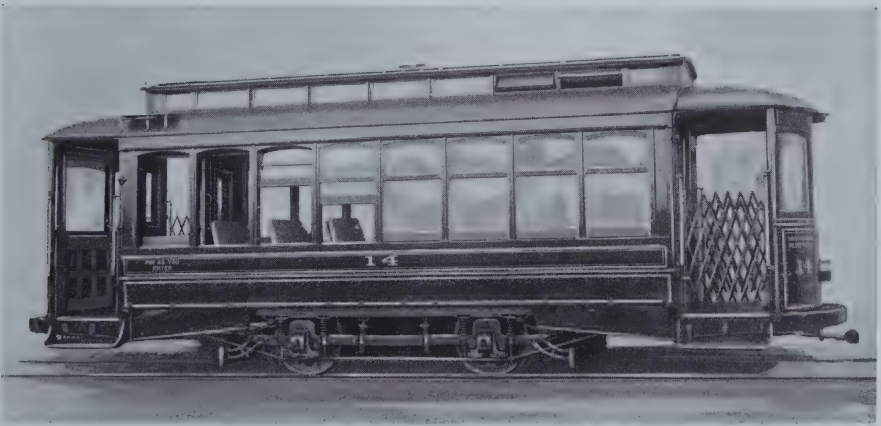
|                                 |                 |                                        |                      |
|---------------------------------|-----------------|----------------------------------------|----------------------|
| Length of body . . . . .        | 28 ft. 8 in.    | From sills to trolley boards . . . . . | 9 ft. 7 3/8 in.      |
| Length over platforms . . . . . | 44 ft. 0 in.    | From floor to headlining . . . . .     | 8 ft. 3 1/2 in.      |
| Length of platforms . . . . .   | 7 ft. 8 in.     | From track to step . . . . .           | 17 1/8 in.           |
| Centers of side posts . . . . . | 2 ft. 8 in.     | From step to platform . . . . .        | 13 in.               |
| Width over sills . . . . .      | 8 ft. 2 1/2 in. | From platform to car floor . . . . .   | 9 5/8 in.            |
| Width over posts . . . . .      | 8 ft. 5 in.     | Seating capacity . . . . .             | 36                   |
| Extreme width . . . . .         | 8 ft. 8 in.     | Type of trucks . . . . .               | Brill No. 22-Special |
| From track to sills . . . . .   | 32 3/8 in.      | Type of motors . . . . .               | GE-210—2-65 h.p.     |

## NEW ROLLING STOCK FOR LAKE CHARLES, LA.

### SEMI-CONVERTIBLE TYPE

**A** SHIPMENT of four semi-convertible cars was recently made by the American Car Company to the Lake Charles Railway, Light & Water Works Company. The cars are of the standard Brill patented type, seated for 32 passengers; a sliding sign in the dome designates the part of the car to be occupied by colored people. The large window openings make the car practically as airy as an open-sided car and better suited to the climate, which is semi-tropical with heavy rainfall. Double-truck cars of this type have been in operation on the Lake Charles lines for the past four years and have proved their suitability to the climatic and traffic conditions in every particular.

Lake Charles has had a rapid growth during the past ten years, and being the natural center for the immense lumber trade of that part of the state, with excellent



NEW ROLLING STOCK FOR LAKE CHARLES, LA. These single-truck Brill patented semi-convertible cars, built by the American Car Company, supplement double-truck equipment of the same type.



NEW ROLLING STOCK FOR LAKE CHARLES, LA. With both upper and lower sashes raised into the roof pockets, this car is practically as open and airy as the regular summer car, and is admirably adapted to warm climates.

manufacturing and shipping facilities, it is destined to rank high among the lumber cities of the Gulf. The lines reach the base ball grounds, an amusement park and a popular beach on the lake, where there is a large pier provided with attractions of all kinds in addition to boating, fishing and bathing.

The principal dimensions of the new cars are as follows:

|                                |                           |                                |                           |
|--------------------------------|---------------------------|--------------------------------|---------------------------|
| Length of body . . . . .       | 20 ft. 8 in.              | From floor to headlining . . . | 8 ft. 4 $\frac{1}{4}$ in. |
| Length over platforms . . .    | 30 ft. 1 in.              | From track to step . . . . .   | 14 $\frac{7}{8}$ in.      |
| Length of platforms . . . .    | 4 ft. 8 $\frac{1}{2}$ in. | From step to platform . . . .  | 12 in.                    |
| Centers of side posts . . . .  | 29 in.                    | From platform to car floor . . | 7 $\frac{3}{8}$ in.       |
| Width over sills . . . . .     | 7 ft. 9 $\frac{1}{2}$ in. | Seating capacity . . . . .     | 32                        |
| Width over posts . . . . .     | 8 ft. 2 in.               | Type of trucks . . . . .       | Brill 21-E                |
| Extreme width . . . . .        | 8 ft. 5 in.               | Motors . . . . .               | West. 92—2-35 h.p.        |
| From track to sills . . . . .  | 26 $\frac{3}{8}$ in.      | Wt. of car body (approx.) . .  | 12,300 lbs.               |
| From sills over trolley boards | 9 ft. 2 in.               |                                |                           |

## A POPULAR TYPE OF COMBINATION CAR

## SEMI-CONVERTIBLE WINDOW SYSTEM

COMBINATION passenger and smoking cars of the Brill semi-convertible type have lately been delivered to the Cumberland Railway Company, of Carlisle, Pa., and to the Frederick Railroad Company, of Frederick, Md. These cities are about sixty miles apart, in the broad and fertile valleys at the northern end of the Blue Ridge Mountains. All through this section this type of car is found on the lines which extend in all directions from the important centers. Within a radius of 100 miles are the railways mentioned above, the Chambersburg, Greencastle & Waynesboro Railway, Danville & Bloomsburg Railway, Hummelstown & Campbellstown Railway, York Railways, Cumberland Valley Railroad, Cumberland & Westernport Railway, Frostburg, Cumberland & Eckhart Railway, Conestoga Traction, Hagerstown Railway, and several others, all of which lines use the same type of cars as those illustrated, and almost identical in every dimension and feature. With one or two exceptions the length of the car body is the same—30 ft. 8 in. In other



A POPULAR TYPE OF COMBINATION CAR. Length of body, 31 ft. 8 in. Length of baggage compartment, 9 ft. 2 in. Seating capacity, 32. Mounted on Brill No. 27-G trucks.

places in Pennsylvania and Maryland the same car will be found; amongst these are Scranton, Shamokin, Punxsatawney and Warren, and in various parts of the country, but the use of the type on such a number of roads within a comparatively small territory must have some definite reason. In the first place, the districts tributary to all of these neighboring railway lines have about the same distribution of population, the same industries and general conditions. The cities which the lines connect or radiate from are centers of diversified manufactures, and are the markets for much of the dairy and garden products of the farms along the lines; also the farms obtain supplies from the nearby cities. With such cars the lines can furnish transportation both to the inhabitants and to the products and merchandise of the region. If the baggage compartments are not filled with goods or produce, they can be used as smoking compartments and are provided for that purpose with folding benches. The lines are not long, probably averaging 8 to 10 miles for each division, and in most cases the track is along the principal highway of the section. The cars are run at frequent intervals throughout the day, and trailers are used in some cases during the early morning, at noon and evening.

Dropped platforms and single platform steps are used because of the frequent stops and because the passengers mount



A POPULAR TYPE OF COMBINATION CAR. Length of body, 29 ft. Length of baggage compartment, 9 ft. 2 in. Seating capacity, 28. Mounted on Brill No. 27-G trucks.



A POPULAR TYPE OF COMBINATION CAR. A typical interior of a Brill semi-convertible combination car.

from the pavement or roadway. Most of the cars are mounted on Brill No. 27-G trucks, which operate smoothly at 35 miles an hour. The semi-convertible feature has long been popular throughout the large and small cities of this part of the country and, by the way, was first used in cars built for one of the cities in this particular section. It adapts the car equally to summer and winter service, permits a light, staunch construction, and carries with it several decided advantages over the drop-sash type, and in all particulars is as well suited to this class of service as to city service, where it is best known.

The principal dimensions of the Cumberland Railway cars are as follows:

|                                 |              |                                        |              |
|---------------------------------|--------------|----------------------------------------|--------------|
| Length of body . . . . .        | 29 ft. 0 in. | Centers of side posts . . . . .        | 2 ft. 8 in.  |
| Length over platforms . . . . . | 38 ft. 5 in. | Width over posts . . . . .             | 8 ft. 2 in.  |
| Length of platforms . . . . .   | 4 ft. 8½ in. | Track to sills . . . . .               | 2 ft. 7¾ in. |
| Length of baggage comp. . . . . | 9 ft. 2 in.  | From sills over trolley b'ds . . . . . | 9 ft. 2¾ in. |

The principal dimensions of the Frederick cars are as follows :

|                                 |                           |                                        |                           |
|---------------------------------|---------------------------|----------------------------------------|---------------------------|
| Length of body . . . . .        | 31 ft. 8 in.              | From sills over trolley b'ds . . . . . | 9 ft. 4 $\frac{7}{8}$ in. |
| Length over platforms . . . . . | 41 ft. 1 in.              | Floor to headlining . . . . .          | 8 ft. 5 $\frac{1}{8}$ in. |
| Length of platforms . . . . .   | 4 ft. 8 $\frac{1}{2}$ in. | Track to step . . . . .                | 17 in.                    |
| Length of baggage comp. . . . . | 9 ft. 2 in.               | Step to platform . . . . .             | 14 $\frac{1}{2}$ in.      |
| Centers of side posts . . . . . | 2 ft. 8 in.               | Platform to floor . . . . .            | 8 $\frac{1}{8}$ in.       |
| Width over posts . . . . .      | 8 ft. 6 in.               | Seating capacity . . . . .             | 32                        |
| Track to sills . . . . .        | 2 ft. 8 $\frac{3}{4}$ in. | Trucks . . . . .                       | Brill 27-G1               |



## A HISTORY OF THE J. G. BRILL COMPANY

JAMES RAWLE

IV

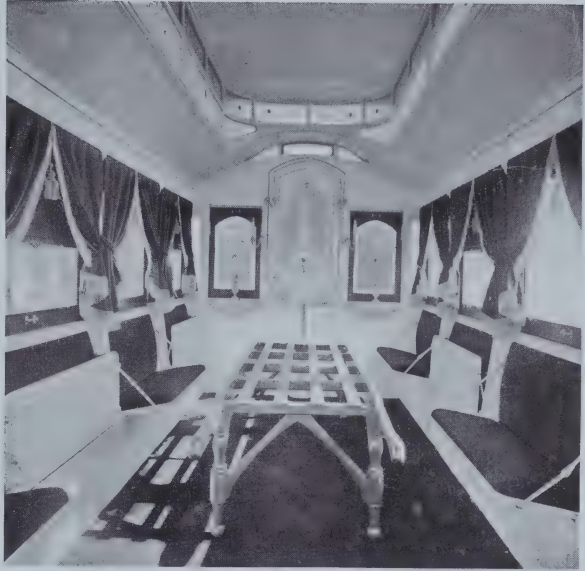
A TRIFLING retrogression will give a résumé of the progression of the work. The two-horse street cars of 1870 were 16 feet long and were heavy in proportion to their carrying capacity, for, while seating only 22, they weighed almost three tons.

An inventor by the name of J. B. Slawson, who was connected with the street railways of New Orleans, introduced the fare-box and bob-tailed car, both of which at about that time were much used throughout the United States and materially increased the number of cars in operation.

There were built for the Latin-American countries at this time funeral cars of several classes. The costliest was decorated with black hangings; with black plush seats which could be swung out of the way and which carried the mourners; with a white altar and superincumbent crucifix; and gorgeous lamps were along the outside. Each had a bier, and the entire rear end of the car was removable. The second-class had simpler arrangements, while the third-

class was arranged with two tiers in which six coffins could be stowed.

Another type of car was the open summer car which was in use at about this time and was very simple in its construction. A little later malleable iron panels for the ends of the seats formed an innovation of a very considerable degree of merit.



Funeral cars furnished to the street railways of Latin-American cities were more or less elaborate, according to the class of service. The interior illustrated is of a first-class car

Steam motor cars were built at Troy and were operated by Ransom engines and were in use in Philadelphia during the Centennial year. Later the Brill Company built a number of cars for steam operation for the Baldwin Locomotive Works and about 1885 a car with an oscillating engine, in which the cylinders were hung on trunnions as the cylinders oscillated, was designed and constructed by General John B. Imboden,

the celebrated cavalry general of the Confederate service, which was experimented with for a considerable time in Philadelphia.



One of the earliest vestibuled trolley cars with "steam car" roof. Built in 1891

The system of operation by un-



A typical trolley car of 1890-91, mounted on the first truck to have plate springs in addition to coil springs. This combination and arrangement of springs reduced the oscillation of the car body

derground cables came into use in eastern cities about 1885. San Francisco was the first, in 1873, to use this method of propulsion, actuated thereto by the very stiff grades in that city. It was followed by cable

lines in Philadelphia in 1884; Pittsburgh, Cincinnati and New York, a number of years later. Strangely, New York is one of the few cities in the world which retains old-fashioned horse cars, although a few times a year orders are placed for horse cars for plantation service.

We have now arrived at the date of the year 1890, which finds the Brill Company domiciled and under full headway at the 62d Street plant, the locality of which, though named "Mount Moriah," the appellation of the dominant cemetery in that section of Philadelphia, yet no characteristics of a place for the dead were imparted to these works, which were merrily busy day and night providing for the living, with George Martin Brill at the helm, James Rawle handling the purse-strings, John A. Brill distributing the product and working his clever brain day and night for new features. Competition had not as yet become so fierce, and the next few years were merry ones. [TO BE CONTINUED]



A forerunner of the present double-truck city car. This was one of the first cars to be operated with "maximum-traction" trucks. Built early in 1891

# THE J. G. BRILL COMPANY

**Main Office : PHILADELPHIA, U. S. A.**

Cable Address : "BRILL," Philadelphia

**London Office : 110 Cannon Street, E. C.**

Cable Address : "AXLES," London

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**American  
Car Company**  
St. Louis, Mo.

**G. C. Kuhlman  
Car Company**  
Cleveland, Ohio

**John Stephenson Company**

Elizabeth, N. J.

**Wason  
Manufacturing Company**  
Springfield, Mass.

**Danville  
Car Company**  
Danville, Ill.

**COMPAGNIE J. G. BRILL**

14 Place de Laborde, Paris

Cable Address : "BOGIBRIL"

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## AGENCIES

### Pacific Coast

Pierson, Roeding & Co.  
409 Monadnock Building  
San Francisco

### Australasia

Noyes Brothers  
Melbourne, Sidney,  
Dunedin, Brisbane, Perth

### Mexico

International Machinery &  
Engineering Co.  
Mutual Bldg., Mexico, D.F.

### Belgium and Holland

C. Dubbelman  
45 Rue de la Caserne  
Brussels

### Argentine and Uruguay

Federico H. Bagge  
Calle San Martin 201  
Buenos Aires

### Natal, Transvaal and

**Orange River Colony**  
Thomas Barlow & Sons  
Durban, Natal

### Italy

Giovanni Checchetti  
Piazza Sicilia, 1  
Milan

### China

Shewan, Tones & Co.  
Hong Kong, Canton  
Shanghai



## OMNIBUS BODIES

For the development of outlying districts before investing in track and overhead material, which entail a series of fixed charges, omnibuses of this kind might be used. The cost is somewhat less than the cost of a car and the bus can cover a wider field and can change its route if circumstances show that development is taking a different course than expected. If the suburb fails to develop, the equipment still has a tangible value and can be utilized elsewhere. If the population increases sufficiently to warrant the construction of a railway, the buses lose none of their value thereby, being available for the development of some other suburb. The omnibus illustrated has longitudinal seats accommodating eighteen passengers and there is standing room for as many more. There is but one entrance and exit, so that one man serves both as chauffeur and conductor.

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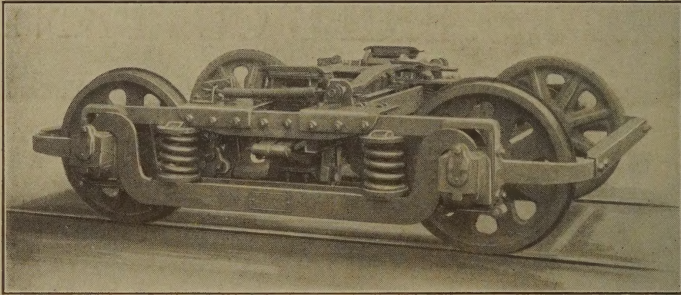
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Durban, Natal

#### Italy

Giovanni Checchetti  
Piazza Sicilia, 1  
Milan

#### China

Shewan, Tomes & Co.  
Hong Kong, Canton  
Shanghai



## BRILL No. 27-M. C. B. TRUCK

The one-piece solid forged side frames which are a fundamental feature of this truck, provide greatest strength where it is most needed and make possible a transom, pedestal tie-bar and end-frame construction which insures permanent squareness and rigidity to the entire frame. Accessibility of the brake parts is an important feature secured by this frame. The bolster is made of a single steel casting. The truck is made for four sizes of journals, viz.;  $3\frac{3}{4} \times 7$ ,  $4\frac{1}{2} \times 8$ ,  $5 \times 9$  and  $5\frac{1}{2} \times 10$ . It has been adopted by the Public Service Railway Co., of N. J., the Scioto Valley Traction, Boston Elevated Railway, Illinois Traction System, Lehigh Valley Transit, Philadelphia Rapid Transit (elevated system), New York & Long Island Traction, Northern Ohio Traction, Chicago & Joliet, British Columbia Electric and thirty other of the foremost railway companies.

**THE J. G. BRILL COMPANY**  
PHILADELPHIA - - - PENNSYLVANIA